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# Implementation of a Pediatric Post-Operative Hand-Off Tool: A Patient Safety Project

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Implementation of a Pediatric Post-Operative Hand-Off Tool: A Patient Safety Project

Kaye Remo

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### **Abstract**

**Problem:** The clinical nurse leader (CNL) performed a microsystem assessment using the Dartmouth assessment tool to evaluate the microsystem's readiness to provide safe care for pediatric post-operative cardiovascular patients. The microsystem is a 12-bed unit caring for critically ill pediatric patients requiring intensive monitoring and therapy. The microsystem's interdisciplinary team is comprised of medical doctors, nurses, respiratory therapists, social workers, nutritionists, child life specialists, and pharmacists. During assessment and gap analysis, the CNL identified gaps in nursing knowledge and skills to deliver safe care for this patient population during the immediate post-operative phase of recovery. There is a concern for patient safety and poor quality outcomes due to these gaps. Since it is a new patient population for the microsystem, there are no protocols nor tools in place for nurses to feel confident in their ability to safely and effectively care for these patients.

**Context:** As part of the organization's integration efforts, the pediatric cardiovascular surgical service will be offered to its members beginning August 2018. This service will be piloted in a 12-bed microsystem, where the care of the patients post-operatively will occur. The microsystem interdisciplinary team has never cared for these patients in their immediate post-operative phase of recovery. Approximately 40% of the nurses in the microsystem are master's prepared, and 85% of the nurses in the microsystem have over 5 years of experience in the pediatric intensive care unit (PICU). Because this is a new patient population for the microsystem, a nursing knowledge and skills gap was identified. Nurses are not confident and competent to care for these patients in the current state. To address this, prior to the first surgical date of August 15, 2018, the organization partnered with a neighboring organization with extensive experience in caring for congenital heart disease patients for training and education. Thirty-five out of 70

nurses in the microsystem, who volunteered to be part of the core group of cardiothoracic (CT) surgery trained nurses, were sent to that organization for training and education. Each nurse received 32 hours of didactic classes and 36 hours of hands-on precepted training in the other organization. The microsystem also provided 8 hours of further education and training of equipment and simulation. After training and education, the CNL collaborated with the nurse manager and frontline interdisciplinary team to create a hand-off tool and to define nurse roles during post-operative take back to ensure safety and quality outcomes during the most critical phase of the patient's recovery.

**Intervention:** The interdisciplinary team created a post-operative hand-off tool for a safe hand off at the PICU. The tool includes basic patient information, weight, diagnosis, surgical procedure, intraoperative information such as anesthesia and sedation used, blood products and medications administered during the procedure, and events such as arrhythmia and bleeding. The tool also has information pertinent to post-operative care, such as vital signs parameters, pain and sedation plan, medications, laboratory monitoring, and other details important for the nurse to monitor. The frontline nurses also created defined nursing roles during the post-operative take back to help ensure that all necessary care and tasks are safely accomplished in a timely and effective manner.

**Measures:** Direct observation was done during the hand-off process to evaluate completion of all items in the hand-off tool at the PICU during hand off. Direct observation was done on the execution of the RN1 and RN2 roles. The goal is 100% utilization of the tool and the defined RN roles every post-operative take back.

**Results:** Four surgical cases were performed since August 15, 2018. The hand-off tool and RN1 and RN2 roles have been utilized 100%, with no variances and barriers.

**Conclusion:** The immediate post-operative phase of recovery for a pediatric cardiovascular patient is the most critical and intense period. Attention to detail and timely delivery of care are very important; hence, clear communication is vital during the hand-off process. In an effort to achieve a safe hand-off process and meet the patient's care demands, the interdisciplinary team created the tool and the roles. Based on the results to date, these tools are effective interventions to ensure delivery of safe quality care to acutely ill pediatric patients after CT surgery in the immediate post-operative period.

## **Section II: Introduction**

Staff shortages, continuing cost inflation, and service demand have intensified the call for more effective and efficient use of scarce resources through an integrated service delivery model. Integrated health systems are widely considered to provide superior performance in terms of quality and safety because of effective communication and standardized protocols (Sutter, Oelke, Adair, & Armitage, 2009). New health care payment models and price sensitivity among the growing number of people in high deductible health plans are pushing hospitals to strive for value in their service lines. Hospitals are using a variety of strategies to cut costs, while improving care quality in their service lines (Aston, 2015).

During economic turbulence and regulatory changes, service lines are becoming more integrated into hospital strategic plans where these areas of specialization can thrive (Cantlupe, 2013). Adding a new service line has two advantages—it will attract new patients and revenue, and many programs, such as Affordable Care Act, will incentivize health care organizations and hospitals that expand the service lines they offer (Amirault, 2013). In an ideal world, all hospitals would be clinically integrated, where all departments and health care providers work as a team from the time a patient enters the hospital, throughout his/her hospital stay and experience, and through the post-discharge period (Uppal, 2017).

This organization is the nation's largest nonprofit integrated health care system. Its Northern California region is often seen as a prime example of integrated care. It is an efficient acute care delivery system that addresses patients' needs across the continuum of care and maximizes population health (Pines, Selevan, McStay, George, & McClellan, 2015). To provide comprehensive care to its members and to maintain positive margins, this organization is adding a new surgical service for its pediatric members with congenital heart disease (CHD). The



pediatric cardiothoracic (CT) surgery service within this medical center is considered to be the regional center for excellence in pediatric care. Adding a pediatric CT surgery service in this medical center is part of the integration efforts of this organization. Integration will provide clinical support for this organization's regional patients with CHD.

The first step in employing a successful surgical service is to design the structure and support the objectives (Janatha, n.d.). It is important for the structure to utilize evidence-based practice, protocols, and care pathways that reduce unwanted variations in care and improve patients' experiences and outcomes (Aston, 2015). As a clinician, an interdisciplinary care team manager, patient advocate, educator, and member of the profession, the author of this project analyzed the gaps in the microsystem where critical post-operative care will be delivered to the new pediatric CT surgery patients and provided recommendations that promote patient safety for the new patient population.

### **Problem**

The clinical nurse leader (CNL) performed a microsystem assessment using Dartmouth Institute's (2005) assessment tool to evaluate the microsystem's readiness to provide safe care for pediatric post-operative cardiovascular patients. The microsystem is a 12-bed unit caring for critically ill pediatric patients requiring intensive monitoring and therapy. The microsystem's interdisciplinary team is comprised of medical doctors, nurses, respiratory therapists, social workers, nutritionists, child life specialist, and pharmacists. During assessment and gap analysis, the CNL identified gaps in nursing knowledge and skills to deliver safe care for this patient population during the immediate post-operative phase of recovery. There is a concern for patient safety and poor quality outcomes due to these gaps. Since it is a new patient population for the

microsystem, there are no protocols nor tools in place for nurses to feel confident they are able to safely and effectively care for these patients.

### **PICO Question**

In pediatric CT patients (P), what are the best practices (I) that increase patient safety and improve patient outcomes (O) and in turn prevent harm to the patients?

### **Available Knowledge**

A comprehensive electronic search using CINAHL and Pub Med was conducted in May 2018 to review evidence relating to effective standardized tools and training in relation to patient outcomes in the critical care area. The database search terms used were *communication, critical care, silos, Benner model, novice, expert, hand-off tool, integrated model, cardiothoracic surgery, patient safety, and pediatrics*. Limitations were set to include English only, peer-reviewed, research, systemic reviews, randomized controlled trials, and publication dates no earlier than 2009.

Research indicates that there are a number of approaches to assessing improvement of patient safety and patient satisfaction. According to Heusch, Kahl, Hensel, and Calaminus (2017), surgical techniques for CHD patients do not affect specific negative patient experiences and outcome. However, findings suggest that when integrating a new service line in an organization, it is important to prepare interdisciplinary staff through education and training; implementing a plan-do-study-act (PDSA) cycle throughout the process can help illustrate the challenges brought about by a new service line in any field (Nakayama et al., 2010). Kenward, Whiffi, and Spalek (2017), using Cooper's five stage integrated review method, suggested that nurses contribute to maintaining quality of care by reducing patients' feeling of being unsafe and vulnerable. Using a two-stage survey completed by 235 nurses, Chu (2017) found that nurses

providing compassion through listening and understanding improved job performance and mental health and essentially contributed to safe patient care. Negarahdeh, Bahabadi, and Mamaghani (2014) conducted a controlled clinical trial with 100 patients to evaluate the effect of nursing communication on patient satisfaction and the patient perspective of feeling safe. Negarahdeh et al.'s results indicated that patients felt safe and satisfied when the nurse was consistently able to deliver updates and information about their care. Aitken, Burmeister, Clayton, Dalais, and Gardner (2011) conducted a non-randomized study that included 244 nurses in two different intensive care units (ICU). Aitken et al.'s research demonstrated an increase in patient satisfaction and a decrease in delays in patient care when nurses were active participants in multidisciplinary rounds in the ICU, which positively impacted patient safety and outcomes.

All the methods yielded valid results, as noted by each study, and the standardized measures appeared to be efficient. Nursing presence and involvement in the care of their patients during daily rounds and effective multidisciplinary communication increases patient safety (see Appendix A. Evaluation Table).

### **Rationale**

Clinical decision making is crucial to health care practice. Health care practitioners and frontline clinicians such as nurses are faced with important daily clinical decisions (Stinson, 2017). Benner's *From Novice to Expert* is the theoretical framework used for this project. It is a decision-making model that describes experience as a process of knowing through repeated exposure to situations that lead to a refinement of earlier thoughts and ideas (Stinson, 2017). This theory is used to guide the development of interventions to aid in the competence and the confidence of nurses in the microsystem, who are considered novices in caring for the new patient population.

**Specific Project Aim**

The project has two primary aims: (a) 100% of post-operative patients will have the interdisciplinary hand-off tool completed upon admission to the PICU, and (b) nurses will perform functions of defined roles for 100% of the cases upon admission to the PICU by October 31, 2018.

### **Section III. Methods**

#### **Context**

As part of the organization's integration efforts, the pediatric cardiovascular surgical service will be offered to its members beginning August 2018. This service will be piloted in a medical center with a 12-bed microsystem where the care of the patients post-operatively will occur. The microsystem is comprised of an interdisciplinary team of doctors, nurses, respiratory therapists, and other health care disciplines, who have never cared for these patients in their immediate post-operative phase of recovery. Approximately 40% of the nurses in the microsystem are master's prepared, and 85% of the nurses in the microsystem have over five years of experience in the PICU. Because this is a new patient population for the microsystem, there was a nursing knowledge and skills gap identified. Nurses are not confident and competent to care for these patients in the current state.

To address this gap, prior to the first surgical date of August 15, 2018, the organization partnered with a neighboring organization that has extensive experience in caring for CHD patients for training and education. Thirty-five of the 70 nurses in the microsystem volunteered to be part of the core group of CT surgery trained nurses and were sent to that organization for training and education. Each nurse received 32 hours of didactic classes and 36 hours of hands-on precepted training from the other organization. The CT surgery patient population also requires certain monitoring equipment and supplies that the microsystem needed to purchase and to educate and train the staff on; therefore, the microsystem also provided further education and training, where each nurse received an additional eight hours of equipment and simulation training. After training and education, the CNL collaborated with the nurse manager and

frontline interdisciplinary team to identify tools that help ensure safety and quality outcomes during the hand-off process and immediate post-operative critical phase of the patient's recovery.

The CNL also conducted a detailed strengths, weaknesses, opportunities, and threats (SWOT) analysis to review the internal and external environments of the organization that will have an impact on the success of the CT surgery program (see Appendix B. SWOT Analysis). Strengths include the current business model and excellent customer service culture. Another strength identified is the surgeon. The organization partnered with another organization that has a well-respected heart program, and along with that partnership, a world-renowned surgeon will be performing the surgeries at the medical center. The perceived weaknesses include that this is a new service, and the medical center does not have the required accreditation, equipment, supplies, staff competencies, or staff skills and knowledge. The staff nurses' fear of the unknown and lack of confidence in leadership promotes resistance to agree with the proposed plan (see Appendix C. Project Plan and Appendix D. Project Timeline).

The opportunities identified during the analysis are resolution to the mentioned weaknesses and anticipated increase in member satisfaction because patients and families feel comfortable staying within a system they are familiar with. Bringing this highly-specialized surgical procedure to a community-based medical center is very unique and is a positive gain on the organization's reputation. Hence, member growth for the organization is expected. Reducing the cost per patient for the organization to send them to other facilities that perform pediatric CT surgery is also an opportunity.

The major threats the organization faces are competitors, market demand, vital contract and partners, and sustaining internal capabilities. In this geographic area, there are approximately four organizations within a 50-mile radius that perform the same surgeries with stellar outcomes.

The population for children born with CHD is one in every 100 newborns in the United States, so expected volume is very low. Key stakeholders in the microsystem, such as the department manager, nurse educator, and clinical nurse specialist (CNS), are essential in securing internal stability and sustain internal capabilities of staff nurses delivering safe patient care in the microsystem. A threat to the organization would be if any of these key stakeholders would vacate their position.

If the organization does not integrate its members with CHD, the organization will continue to pay other organization's fee-for-service, which is estimated to be approximately \$500,000 dollars per patient, per surgery, plus or minus other fees for service that relate to their co-morbidities. To date, the organization identified sending approximately 150 cases per year to other organizations, which is an approximate \$75,000,000 per year. If the organization proceeds with the proposed solution and develops the pediatric CT surgery service line to integrate its members with CHD, the organization will no longer pay fee-for-service to other organizations and will benefit from cost avoidance. The microsystem anticipates investing \$650,000 on equipment and supplies that will last for a minimum of five years and \$350,000 for nurses' training and education. The combined anticipated amount to start caring for these patients is less the average cost of \$500,000 per patient, per surgery, performed outside of the organization.

### **Intervention**

A post-operative hand-off tool was created by the interdisciplinary team for a safe hand off at the PICU (see Appendix E). The tool includes basic patient information, weight, diagnosis, surgical procedure, and intraoperative information, such as anesthesia and sedation used, blood products and medications administered during the procedure, and events such as arrhythmia and bleeding. The tool also has information pertinent to post-operative care, such as vital signs

parameters, pain and sedation plan, medications, laboratory monitoring, and other details important for the nurse to monitor. The frontline nurses also created defined nursing roles during the post-operative take back to help ensure that all necessary care and tasks are safely accomplished in a timely and effective manner (see Appendix F).

### **Study of the Intervention**

The hand-off process tool and RN 1 and RN 2 roles were created and implemented by the interdisciplinary team in response to the knowledge and skills gap, as well as lack of confidence of the staff in the microsystem. The tool and roles were adapted from the organization the microsystem partnered with and were adapted and revised according the microsystem's existing policies, protocols, and practice. After 40 hours of interdisciplinary meetings and collaboration later, both interventions were successfully created. Direct observation, data collection, and real time feedback for any variation identified of the hand-off tool and nurses' roles during post-operative take back were conducted by the microsystem's nurse manager, educator, or CNS.

The CNL proposed that the team use the Institute for Healthcare Improvement (IHI, n.d.) Model for Improvement PDSA cycle process to test the new communication tool for ease of use and to ensure that all vital patient parameters were included in the tool. The first cycle will be during the first surgical case where the tool will be utilized. The team will be able to observe if nurses are able to use each element of the tool and identify areas that may need revision and repeat the PDSA cycle with the next four patients to refine the tool (see Appendix G).



**Measures**

Table 1

*Measures*

Measure Outcome	Data Source	Target
Completion of hand-off tool	Direct observation	100% utilization of the hand-off tool for each CT surgery take back
Execution of defined RN1 and RN2 roles	Direct observation	RN1 and RN2 accomplishes each CT surgery take back

**Ethical Considerations**

This project was undertaken as a safety initiative project at the microsystem to standardize communication between the surgical team and the PICU team during hand off post-operatively. As such, this project was approved as a quality improvement (QI) project by the faculty using the QI review guidelines and does not require IRB approval (see Appendix H).

#### **Section IV. Results**

There have been four surgical cases performed since August 15, 2018. The hand-off tool and RN1 and RN2 roles have been utilized 100% of the time, with no variances and barriers (see Appendix I).

## **Section V: Discussion**

### **Summary**

Key findings and lessons learned from this project are the importance of interdisciplinary team work and breaking silos for a successful, safe patient hand-off process. One lesson learned was the importance of involvement of the surgical team at the beginning of the training to understand immediate post-operative clinical evaluation the PICU nurses would be completing. Onsite training of PICU staff with clinical experts allowed for coordinated care and in depth understanding of the hand-off process. Role clarification and specific duties for the PICU nursing staff increased confidence and standardized communication. To date, four PDSA cycles of the intervention have been completed, and the intervention has been utilized 100% without any deviation or variance in the process. The intervention is found to be successfully implemented, and no patient harm has been reported during the hand-off process.

### **Conclusion**

The immediate post-operative phase of recovery for a pediatric cardiovascular patient is the most critical and intense period. Attention to detail and timely delivery of care are very important; hence, clear communication is vital during the hand-off process. In an effort to achieve a safe hand-off process and to meet the patient's care demands, the tool and roles were created by the interdisciplinary team. The concept of a standardized communication tool ensures that all critical elements of care are reviewed and discussed and the opportunity to ask clarifying questions is present. Role clarification ensures effective and efficient care in a timely manner.

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## **VII. Appendices**

Appendix A. Evaluation Table

Study	Design	Sample	Outcome/Feasibility	Evidence Rating
Kenward et al. (2017)	Cooper's five stage integrative review method	Only studies published since 2002, participants in all studies were aged over 18.	Findings suggest that maintaining a quality service for patients, nurses can contribute to the reduction of patients' feeling of being unsafe and vulnerable.	Level II
Chu (2017)	Two-stage survey completed by 235 RNs, hypothesis tested using hierarchical regression analyses	235 RNs employed in hospitals in Taiwan.	When nurses are frequently willing to listen, understand, and help their suffering colleagues, providing compassion can improve the provider's job performance and mental health.	Level 1
Negarandeh et al. (2014)	Quantitative	Controlled clinical trial, 100 hospitalized pts., med/surg, 1-2 hours regular nurse rounding.	Communicative method, performing regular rounds increases patient satisfaction. Limitations – absence of random assignment, nonequivalent control group, interval between evaluation control and experimental groups.	Level 1
Aitken et al. (2011)	Quantitative	244 nurses, convenience sample in 2 ICUs in tertiary hospital.	Implementation of nursing rounds in ICU feasible and effective strategy for initiating change. Limitations – project conducted as non-randomized, two group study in 2 different ICUs.	Level 1
Heusch et al. (2017)	Quantitative	HRQoL was assessed in the questionnaire by asking about the frequency (never, rarely, often, always) of specific negative experiences; more frequent experiences indicate a lower quality of life. Frequency expressions	Different surgical techniques for CHD do not affect children's and adolescents' self-reported HRQoL to the extent that one would expect.	Level 1, Good

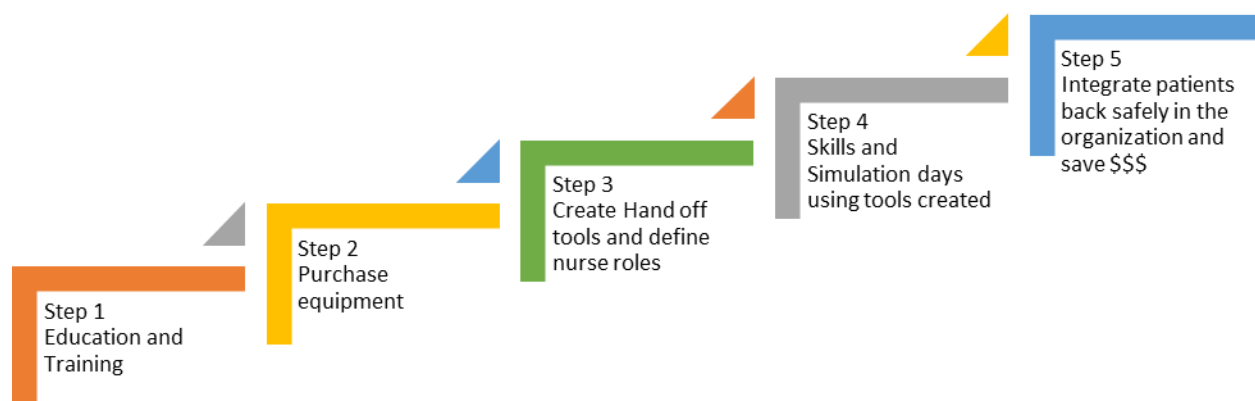


		were transformed into numerical values (25%, 50%, 75%, 100%), and mean values for HRQoL were calculated for each patient and for each domain.		
Nakayama et al. (2010)	Non-research, consensus or position statement	The PDSA team developed a paper checklist to gather data on all inpatient OR procedures performed by the pediatric general surgeons during the one-year implementation period.	The experience of implementing the PDSA cycle at MCCG illustrates the challenges brought about by a new service line in any field, of which pediatric surgery is one example. The power of PDSA is that it provides a management tool to achieve goals using measurable objectives that involve a multiplicity of interacting departments, which made it an appropriate choice for introducing a new pediatric surgical service line.	Level V, Good Quality

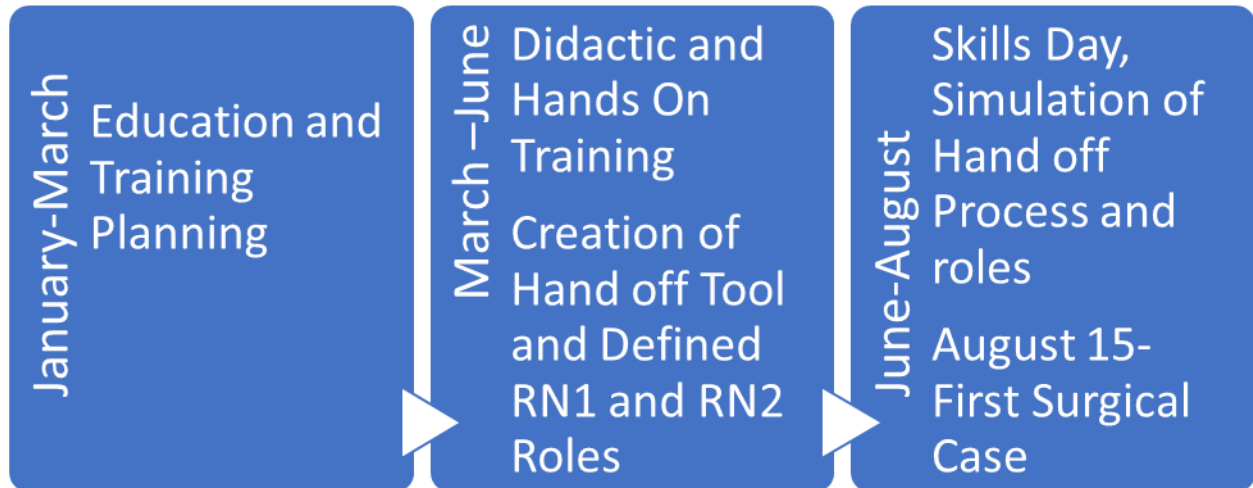
## Appendix B. SWOT Analysis



## Appendix C. Project Plan



## Appendix D. Project Timeline



## Appendix E. Hand-Off Tool

## CV OR Pre-Arrival Checklist

RN giving report \_\_\_\_\_ Estimated Arrival Time \_\_\_\_\_

Pt Name \_\_\_\_\_

Age \_\_\_\_\_ WT \_\_\_\_\_ Allergies \_\_\_\_\_

Dx \_\_\_\_\_

PMHx \_\_\_\_\_

Surgical Procedure \_\_\_\_\_

Intraoperative Events \_\_\_\_\_

Open Chest Yes No

## Lines/Wires

- ☐ ART \_\_\_\_\_
- ☐ UAC \_\_\_\_\_
- ☐ RA \_\_\_\_\_
- ☐ RV \_\_\_\_\_
- ☐ CVL's \_\_\_\_\_
- ☐ PIV's \_\_\_\_\_
- ☐ Pacer wires \_\_\_\_\_
- ☐ Other \_\_\_\_\_

## Drains

- ☐ Chest Tubes
  - ☐ Pleural \_\_\_\_\_
  - ☐ Mediastinal \_\_\_\_\_
  - ☐ # Pleuravacs \_\_\_\_\_
- ☐ Foley \_\_\_\_\_
- ☐ Other Drains \_\_\_\_\_

## Infusions

- ☐ Dopamine \_\_\_\_\_
- ☐ Epinephrine \_\_\_\_\_
- ☐ Norepinephrine \_\_\_\_\_
- ☐ Milrinone \_\_\_\_\_
- ☐ Calcium \_\_\_\_\_
- ☐ Sedative/Narcotic \_\_\_\_\_
- ☐ Other \_\_\_\_\_

## Respiratory

- ☐ Expected extubation Yes No
- ☐ ETT size \_\_\_\_\_
- ☐ Vent settings \_\_\_\_\_
- ☐ Nitric Oxide \_\_\_\_\_

Additional Information:

## Appendix F. RN1 and RN2 Responsibilities

RN 1 - first 30 minutes post-op	RN 2 - first 30 minutes post-op
<ol style="list-style-type: none"> <li>1. Connect all transducer cables to the appropriate lines, zero pressure readings. Assure waveform is appropriate for each line. Compare hemodynamics with reported OR Hemodynamic values.</li> <li>2. If arterial wave form is dampened or arterial blood pressure is uncertain, obtain a cuff blood pressure.</li> <li>3. Apply ECG leads, attach and connect pulse oximeter and NIRS probes to monitor.</li> <li>4. Evaluate cardiac rhythm for presence of normal sinus rhythm.</li> <li>5. Check Capillary Refill Time, pulses, skin color and status (warm, cool, cold, hot).</li> <li>6. Assess heart sounds and sternal incision or open chest pericardial patch.</li> <li>7. Assess breath sounds to assure patency and placement of ETT. Assess security of ETT.</li> <li>8. Obtain verbal report from the Anesthesiologist, CT Surgeon, Cardiologist. Report should include but not limited to the following: <ul style="list-style-type: none"> <li>• Operative procedure</li> <li>• Any significant OR event</li> <li>• Cardio-pulmonary bypass time</li> <li>• Aortic cross clamp time</li> <li>• Circulatory arrest time</li> <li>• Expiration time for blood products brought from OR</li> <li>• Type and amount of blood products available in Blood Bank</li> <li>• Location and type of IV lines</li> <li>• Inotropic Support</li> <li>• Administration time of most recent analgesia</li> <li>• Administration time of OR antibiotics</li> <li>• Assess skin with Anesthesiologist (Occiput, sacral area, all IV sites)</li> </ul> </li> <li>9. Perform Physical Assessment</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect all pleurevac to wall suction at 100-140 mmHg.</li> <li>2. Set dry suction control on pleurevac at 15-20 cm H2O. Verify that red float appears on window.</li> <li>3. Assess patency of chest tubes.</li> <li>4. Record level of CT drainage from the OR on pleurevac and document in patient chart.</li> <li>5. Manipulate mediastinal tubes to assure patency and prevent clotting. Secure to bed.</li> <li>6. Obtain initial vital signs and record in patient chart.</li> <li>7. Attach rectal/bladder probe to monitor for continuous temperature monitoring if needed.</li> <li>8. Obtain and send initial labs. These include: ABG with co-oximetry, electrolytes, glucose, BUN, Cr, Mg+, phosphorus, ionized calcium, PT, PTT, fibrinogen, CBC, diff, platelets, serum lactate, MV02 when applicable. (Use iStat to obtain first ABG with electrolytes; use glucometer to run a blood glucose).</li> <li>9. Measure and record urine output in patient chart.</li> <li>10. Document admission and Q15 minute vital signs.</li> <li>11. Give sedation/analgesia as ordered and any other immediate orders as ordered by physician.</li> <li>12. Obtain CXR at bedside.</li> <li>13. Obtain 12 lead EKG at bedside.</li> <li>14. Attach appropriate IV fluids and medications as ordered.</li> <li>15. Encourage parents to visit, orient to bedside, provide support and answer questions.</li> </ol>

## Appendix G. PDSA Worksheet

## PDSA Worksheet

**Name of Organization:** Microsystem**Date:** February 15, 2018**Selected improvement area:** Prevention strategy/Improve post-operative hand off communication tool for CVOR patients**Tool:** Inter-disciplinary feedback (CT Surgery, PICU MD, PICU RN, Anesthesia, Cardiology, RT)**Step:** Collaboration and discussion of contents**Cycle:** 1<sup>st</sup> try

## PLAN

**I plan to:** We are going to create a hand off tool for CVOR patients as part of the post-operative hand off process in the PICU.**I hope this produces:** We hope to create a hand off tool that pertains all necessary information to safely manage and care for the CVOR patients in their immediate post-operative phase of recovery**Steps to execute:**

1. We will review other organizations' microsystems' hand off tools available to us and perform a gap analysis with what we currently have in place
2. We will review current microsystem tools, protocols and procedures
3. Each team will contribute and add information on the tool
4. We will create a hand off tool based on everyone's input and contribution

## DO

**What did you observe?**

We noticed that all microsystems that care for CVOR patients have information that is common in all the hand off tools we reviewed

Our microsystem's current tool and process does not have any of those information

The interdisciplinary team is very proactive in contributing to the new process and tool we are trying to create

## STUDY

**What did you learn? Did you meet your measurement goal?**

At this time, we are only brainstorming and creating the actual tool. We did learn that there is very specific information that need to be included in the hand off tool as it affects the post-operative management of the patients. The process of collaboration worked well. Everyone in gave their input and a tool has been created.

## ACT

**What did you conclude from this cycle?**

The interdisciplinary team collaboration worked well. Everyone gave their input and a hand off tool has been created.

**PDSA Worksheet****Name of Organization:** Microsystem**Date:** June 15, 2018**Selected improvement area:** Prevention strategy/Improve post-operative hand off communication tool for CVOR patients**Tool:** Post-operative Hand Off Tool and RN1/RN2 defined roles**Step:** Simulation of CVOR case and post-operative admission in the microsystem**Cycle:** 2nd try**PLAN**

**I plan to:** We are going to test the process of utilizing the pre-arrival and bedside hand off tool created by the interdisciplinary team in a day in life simulation and test the defined RN 1 and RN 2 roles.

**I hope this produces:** We hope that staff will provide feedback the tool and work on any more gaps identified or editing the tool to fit the workflow.

**Steps to execute:**

We will utilize the hand off tool edited on May 2018 and the RN 1 and RN 2 roles during the simulation

The CNL will collect feedback from team during debriefing

We will collect all feedback and apply any necessary changes

We will try the tool again on the next simulation

**DO****What did you observe?**

Appropriate team members in the room, decreased noise and chaos

The interdisciplinary team followed the simulation script and scenario created by the CNL

The PICU attending led the hand off process and the hand off tool was utilized

The RN 1 and RN 2 carried out their roles with more clarity

**STUDY****What did you learn? Did you meet your measurement goal?**

This simulation is more orderly and the hand off tool and RN roles were utilized effectively.

This process worked better. Upon debriefing, there was a need to lessen information in the tool that are found to be unnecessary. No feedback for the RN 1 and RN 2 roles.

**ACT****What did you conclude from this cycle?**

Simulation process, scenarios and scripts need to be clear to everyone prior to starting the simulation and orchestrated by a leader.

Will edit the hand off tool as suggested.



**PDSA Worksheet****Name of Organization:** Microsystem**Date:** May 15, 2018**Selected improvement area:** Prevention strategy/improve post-operative hand off communication tool for CVOR patients**Tool:** Post-operative Hand Off Tool**Step:** Simulation of CVOR case and post-operative admission in the microsystem**Cycle:** 1<sup>st</sup> try**PLAN****I plan to:** We are going to test the process of utilizing the hand off tool created by the interdisciplinary team in a day in life simulation**I hope this produces:** We hope that staff will provide feedback the tool and work on any more gaps identified or editing the tool to fit the workflow.**Steps to execute:**

We will utilize the hand off tool created on February 2018 during the simulation

The CNL will collect feedback from team during debriefing

We will collect all feedback and apply any necessary changes

We will try the tool again on the next simulation

**DO****What did you observe?**

The team was uncertain about who leads the hand off process

There were too many people in the room, making it hard to hear each other

There was no one orchestrating the simulation. It was quite chaotic.

The hand off tool was not fully utilized due to the confusion of roles and the entire post-operative process

**STUDY****What did you learn? Did you meet your measurement goal?**

This is the first attempt to use the hand off tool. The process did not work well due to lack of planning and orchestration of the simulation. We need to develop a scenario with script for the next simulation related to post-operative admission and hand off.

Per feedback, a 1-hour pre-arrival report should be done so the team in the microsystem can prepare necessary equipment, supplies and medications.

**ACT****What did you conclude from this cycle?**

There were uncertainties on who's turn it is to speak or what the nurse is supposed to do at a certain time, and what is priority during the hand off process. There is a need to define RN 1 and RN 2 Roles during the hand off process so both nurses are clear on who is performing what task. There is a need to add pre-arrival call to the microsystem, so the microsystem can safely prepare to receive the patient.

**PDSA Worksheet****Name of Organization:** Microsystem**Date:** July 15, 2018**Selected improvement area:** Prevention strategy/Improve post-operative hand off communication tool for CVOR patients**Tool:** Post-operative Hand Off Tool and RN 1/RN 2 defined Roles**Step:** Simulation of CVOR case and post-operative admission in the microsystem**Cycle:** 3rd try**PLAN**

**I plan to:** We are going to test the process of utilizing the pre-arrival and bedside hand off tool created by the interdisciplinary team in a day in life simulation and test the defined RN 1 and RN 2 roles.

**I hope this produces:** We hope that the edited tool and roles will be utilized effectively during simulation.

**Steps to execute:**

We will utilize the hand off tool edited on June 2018 and the RN 1 and RN 2 roles during the simulation

The CNL will collect feedback from team during debriefing

We will collect all feedback and apply any necessary changes

We will use the tool on First Post Op day on August 15, 2018

**DO****What did you observe?**

The interdisciplinary team followed the simulation script and scenario

The PICU attending led the hand off process and the hand off tool was utilized

The RN 1 and RN 2 carried out their roles with no barriers

**STUDY****What did you learn? Did you meet your measurement goal?**

The hand off tool and RN roles were utilized effectively. This process worked well. Upon debriefing, there was no need to edit the tool. No feedback for the RN 1 and RN 2 roles.

**ACT****What did you conclude from this cycle?**

We are ready to use this tool and process on the first surgical case on August 15, 2018.

## Appendix H. IRB Statement of Non-Research Determination Form

**Student Name:** \_\_\_\_\_**Title of Project:** Implementation of a Pediatric Post-Operative Hand-Off Tool: A Patient

Safety Project

**Brief Description of Project:**

Nature of the Project:

Integrating a new surgical service

Data That Shows the Need for the Project

Goal of the Project Goals

- Quality patient care using a multidisciplinary team approach for patients with CHD requiring cardiovascular surgery.
- Education for physicians and nurses focusing on caring for CHD and CHD Surgery
- Safe delivery of care by ensuring appropriate staffing skill mix is available in the microsystem and 2:1 nursing ratio for the first 4 hours post-operative phase of recovery
- Robust discharge teaching plan and transitional care with community support for CHD patients and their family
- Availability of equipment necessary to provide care for these patients
- Emergency preparedness for CHD patients that require resuscitation and cannulation to Extracorporeal Membrane Oxygenation (ECMO) machine

Evidence to Support the Project

**A) Aim Statement:** To ensure patient safety by monitoring and evaluating adherence to new policies and procedures specific to the Peds CV Surg Program monthly with zero sentinel events.

**B) Description of Intervention:** Education, Training, Completion of Competency Based Orientation at UCSF, Adding new Policy and Procedure for this patient population

**C) How will this intervention change practice?** Preparing the PICU and PICU staff to care for the new patient population

<b>D) Outcome measurements</b>		
<b>Measure</b>	<b>Data Source</b>	<b>Target</b>
<b>Outcome</b>		
<ul style="list-style-type: none"> <li>• Completion of Hand-off tool</li> <li>• Execution of defined RN 1 and RN 2 roles</li> </ul>	Direct observation	<ul style="list-style-type: none"> <li>• 100% utilization of the hand-off tool for each CT surgery take back</li> <li>• RN 1 and RN 2 accomplishes defined tasks each CT surgery take back</li> </ul>
<b>Process</b>		
Pediatric CV Surgery order set met during immediate post-operative admission	Chart review-Health connect	100%

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:

(<http://answers.hhs.gov/ohrp/categories/1569>)

☒ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐ This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

### **EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST \***

**Instructions: Answer YES or NO to each of the following statements:**

<b>Project Title:</b>	<b>YES</b>	<b>NO</b>
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	<b>X</b>	
The specific aim is to improve performance on a specific service or program and <b>is a part of usual care</b> . ALL participants will receive standard of care.	<b>X</b>	
The project is <b>NOT</b> designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does <b>NOT</b> follow a protocol that overrides clinical decision-making.	<b>X</b>	

The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does <b>NOT</b> develop paradigms or untested methods or new untested standards.	<b>X</b>	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does <b>NOT</b> seek to test an intervention that is beyond current science and experience.	<b>X</b>	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	<b>X</b>	
The project has <b>NO</b> funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	<b>X</b>	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., <b>not</b> a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	<b>X</b>	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: <i>"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."</i>	<b>X</b>	

**ANSWER KEY:** If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

\*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

**STUDENT NAME (Please print): Kaye Marie June C Remo**

**Signature of Student:**

**DATE** 5/25/18

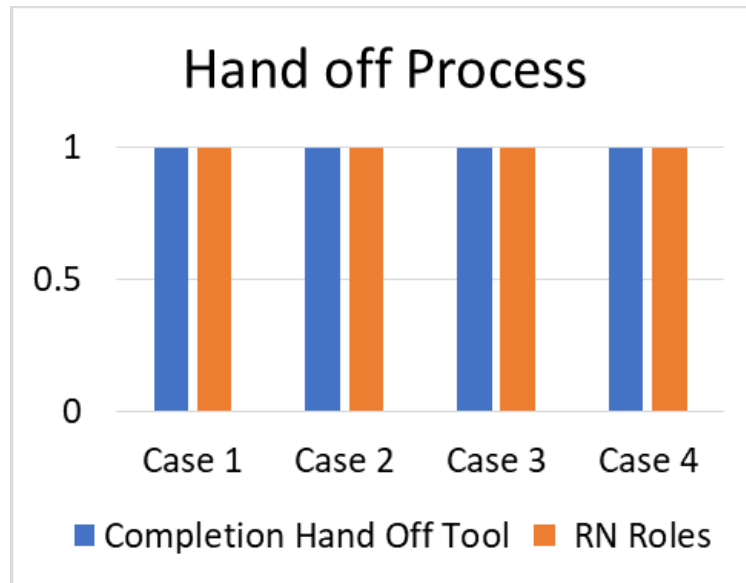
**SUPERVISING FACULTY MEMBER (CHAIR) NAME (Please print):**

**Dr. Daniel Pellegrini, MD**

**Signature of Supervising Faculty Member (Chair):**

**DATE** 5/25/18

Appendix I. Results Data



## Appendix J. Project Charter

**Global Aim:**

To introduce and integrate a safe and successful Pediatric Cardiothoracic Surgery Program (Peds CT Surg) in an existing 12-bed Pediatric Intensive Care Unit within a regional community hospital and integrated delivery system by August 2019.

**Specific Aim:**

To ensure quality and patient safety by monitoring and evaluating adherence to new policies and procedures specific to the Peds CT Surgery Program monthly with zero sentinel events.

**Background:**

To provide comprehensive care to its members and maintain positive margins, the microsystem is adding a new surgical service for its pediatric members with congenital heart disease (CHD): The Pediatric Cardiothoracic Surgery. In response to concerns about the quality and safety of nursing care in the complex, technologically advanced, ever-changing health care system, the Clinical Nurse Leader (CNL) was developed (Stavrianopolous, 2012). The CNL in this microsystem uses the Dartmouth Microsystem Assessment Tool, which evaluates the Pediatric Intensive Care Unit's (PICU) strategy to safely and effectively deliver care for the new CT surgery patient population

The CNL in this microsystem is sought by leadership of the organization to integrate its role as a clinician, an advance generalist, an outcomes manager, an interdisciplinary care team manager, a patient advocate, an educator, an information manager, and a member of the profession (AACN, 2013) for a successful launch of the new Pediatric Cardiothoracic Surgery Service. Criteria for the type of surgeries to be performed in microsystem are limited to Level 1 and II, as defined in The Society of Thoracic Surgeons (STS) Database (The Society for Thoracic Surgeons, n.d.). These patients will be recovered and discharged from the PICU. The expected age group is 1 month up to 21 years old. This microsystem has never cared for CHD patients in their immediate post-surgical stage of recovery. However, they have been cared for in this microsystem when they are admitted for a diagnosis other than need for cardiovascular surgery and intervention.

A review of literature using CINHALL and PUBMED was conducted using the keywords: service line, pediatrics, cardiovascular, surgery, nursing, Clinical Nurse Leader, silos, integrated, health care.

**Sponsors**

Chief Operating Officer
Chief Nursing Executive
Chief of Cardiovascular Services

**Goals**

- Quality patient care using a multidisciplinary team approach for patients with CHD requiring cardiovascular surgery.
- Education for physicians and nurses focusing on caring for CHD and CHD Surgery.
- Safe delivery of care by ensuring appropriate staffing skill mix is available in the microsystem and 2:1 nursing ratio for the first 4 hours post-operative phase of recovery.
- Robust discharge teaching plan and transitional care with community support for CHD patients and their family.
- Availability of equipment necessary to provide care for these patients.
- Emergency preparedness for CHD patients that require resuscitation and cannulation to Extracorporeal Membrane Oxygenation (ECMO) machine.

**Measures**

Measure	Data Source	Target
<b>Outcome</b>		
<ul style="list-style-type: none"> <li>• Completion of hand-off tool</li> <li>• Execution of defined RN 1 and RN 2 roles</li> </ul>	Direct observation	<ul style="list-style-type: none"> <li>• 100% utilization of the hand-off tool for each CT surgery take back</li> <li>• RN 1 and RN 2 accomplishes defined tasks each CT surgery take back</li> </ul>
<b>Process</b>		
Pediatric CV Surgery order set met during immediate post-operative admission	Chart review-Health connect	100%

**Team**

MD Co lead
RN Co Lead
Educator /CNS
Staff nurse champions
Pharmacy champion
MD champions
Anesthesia MD Lead
Cardiovascular Surgery MD Lead
Cardiology MD Lead
Respiratory Therapy Lead
Child life Specialist Lead
Social Work Lead
Cardiovascular Surgery Champion
Education Liaison from other organization